Missouri Department of Natural Resources

Proposed 2016 Listing Methodology Document
RESPONSES TO PUBLIC COMMENTS

Public Notice
October 15, 2013 – January 31, 2014

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Proposed 2016 Listing Methodology - Summary of Public Comments and MDNR Responses

The Missouri Department of Natural Resources posted the draft 2016 Listing Methodology for public comment. The Department accepted written comments from October 15, 2013 through January 31, 2014.

Below is a summary of the Public Comments received in response to the Proposed 2016 Listing Methodology. The comments and responses will be saved to the public administrative record file and is available from the Department's website.

General Listing Methodology Comments

1. Comments received from the St. Louis Metropolitan Sewer District (MSD), city of Springfield, and city of St. Joseph

   Making modifications to the proposed 2016 Listing Methodology Document (LMD) during the public notice process makes public comment difficult and have likely led to inconsistencies and confusion. The Department should improve the consistency of language within and between Tables 1.1, 1.2, B-1, and B-2. Several typographical errors were also noted.

   MDNR Response and Action:

   The Department apologizes for any confusion it may have caused when posting a revised version of the LMD. The revision was completed at the request of a stakeholder during the November 2013 public availability meeting. Additional information was provided to allow reviewers to gain a broader understanding on how fish community data was assessed. Other minor additions or grammatical corrections also occurred, but the additions and changes were noted on the Department's 303(d) webpage. Both versions of the LMD were retained on the Department's website to provide comparison as needed. All changes and updates where indicated in Microsoft Word using the track changes feature.

   The Department agrees the consistency of language within and between Tables 1.1, 1.2, B-1, and B-2 can be improved. As previously stated, it appears that many inconsistencies are new to the proposed 2016 versions, while others appeared to have carried over from previous versions. The Department reviewed the tables and updated as necessary to correct any discrepancies. Any major revisions will occur during the next revision.

   Typographical errors and other inconsistencies were also corrected.

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General Assessment Methodology Comments

2. Comment received from the EPA

   In the discussion of toxic chemicals in Table 1.1 there is an exclusion for fish kills due to natural causes. Is there information to indicate that natural toxic chemicals are released at a frequency of more than once every three years on average?

   MDNR Response:

   A majority of the fish kill notifications are reported to the Department's Environmental Emergency Response (EER) hotline. The EER staff sends notification to the Department's regional office, Missouri Department of Conservation (MDC), and other interested agencies. MDC conducts a follow-up fish kill investigation and provides a report to the Department through their fish kill reporting system summarizing their findings. If a fish kill is not directly associated with a reported incident, then specific toxins are not analyzed due to the expense of characterizing an unknown substance, with the exception of ammonia or other field measurements that can be measured with handheld devices or field kits (e.g., Hach).

   The Department uses the exclusion language in the LMD to eliminate fish fill reports that conclude the problem was due to "summerkill" or "winterkill", both of which are related to oxygen demand exceeding supply caused by high rates of respiration and low volumes in summer, and loss of aeration caused by ice cover in winter.

3. Comment received from the Association of Missouri Clean Water Agencies

   The Department needs to consistently and properly express its one-in-three year listing criteria for toxics. The one-in-three year policy is an EPA policy and not a binding rule. The Department should rely on a greater than 10 percent provision.

   MDNR Response:

   The Department has adopted EPA's once-in-three year maximum allowable excursion recurrence frequency – which is the times conditions in a water are worse than those specified by the concentration and duration components of a freshwater aquatic life criterion for a toxic chemical. EPA's Office of Research and Development recommended the adoption of a 1 in 3 year maximum recurrence interval based upon a literature survey they conducted which looked at recovery rates of freshwater ecosystems from various kinds of natural disturbance and anthropogenic stressors.

4. Comment received from the EPA

   In Table 1.1 the compliance column for dissolved oxygen references a footnote which states that the data is only used for wide scale 305(b) assessments and not 303(d) listing. If this reference is a typographical error and instead should reference footnote 10, that footnote should not apply to dissolved oxygen either.

   MDNR Response and Action:

   The Department agrees, this was an error and was not meant to refer to dissolved oxygen data. This error has been corrected in the "revised" version posted to the Department's 303(d) website (http://dnr.mo.gov/env/wpp/waterquality/303d.htm).

5. Comment received from the EPA

   Table B-1 methods used a two-sided test for bottom deposits. Since the goal is to determine if the deposits are too high not just different from the control site, the test should be single-sided.

   MDNR Response:

   The Department reviewed Table B-1, located in Appendix A. The LMD states "Hypothesis Test, Two Sample, one tailed t-test" for Bottom Deposits (Narrative) under the "Analytical Tool" column.

6. Comments received from Newman, Comley and Ruth

   Table 1.2 and B-2 provides information regarding the assessment of "objectionable bottom deposits." What test applies to the assessment? The t-test should not be used because it does not appear to be a method used in the decision process. A field method for the collection of fine sediment is not provided. How are trash and other materials measured by the percent fine sediment deposit measurement?

   MDNR Response:

   The Department has a draft field procedure for estimating fine sediment deposition. This procedure can be provided upon request.

7. Comment received from EPA

   Table B-1 redefines how the binomial probability will be assessed for greater than 30 samples but there is no note or comment that it is being changed from the commission

approved 2014 methodology and it is inconsistent with the appendix information. How has the state's reconsideration of this difficulty led to the removal of the sample size mediated analysis?

MDNR Response:

The Department has discovered that Microsoft Excel provides a binomial probability function (BINOMDIST). Using the Microsoft Excel function allows the Department to calculate the binomial probability of samples sizes greater than 30.

8. Comments received from MSD and city of Springfield

The methods used to list a water as impaired should be the same as those used to delist the same water.

MDNR Response:

As new information is obtained for a water body, it is reassessed to determine if conditions remain the same or have improved. As long as watershed conditions have remained consistent and no significant or documented pollutant controls have been implemented in the watershed, then all available data will be considered representative and used during the biennial assessment process. With a larger data set (which tends to increase confidence levels), often times the data is assessed using different methods (e.g., 10 percent rule instead of the binomial probability) described in the LMD.

If watershed conditions have changed, significant and documented pollution control measures implemented within a watershed, the Department will consider the historical data (pre-implementation) to no longer be representative. The Department will continue to schedule monitoring or request quality assured data from other available sources to build a representative data set in an effort to document instream changes.

In a few cases, the "level of significance" changes from 0.1 to 0.4 for delisting a water, while in other instances, the data is compared to the upper confidence level instead of the lower confidence level. This is to ensure a previously listed water is now supportive of the beneficial use. The Department has been following these procedures for the past several listing cycles to prevent a water body from continually being listed and delisted if lower level of significance or confidence levels are used.

9. Comment received from MSD

   Revise the Section I. B. regarding "Threatened Waters" to more accurately reflect EPA guidance. Currently the Department is not specific when addressing how threatened waters will be evaluated. Suggested wording was provided "When a statistically-valid time trend analysis indicates that a water currently in Categories 1, 2, or 3, for one or more discrete water quality pollutants will not continue to maintain designated beneficial uses before the next listing cycle, it will be considered a "threatened water." A threatened water will be treated as an impaired water and placed in the appropriate Category (4A, 4B, or 5).

   MDNR Response and Action:

   The Department agrees with the suggested wording.

10. Comment received from MSD

    The Department should add language to Section II.B that allows the use of site-specific calculations, as opposed to default assumptions, when evaluating compliance for some parameters (such as, pH, hardness, and water temperature). The Department should amend Section II.B, and any other relevant section, to both identify any default data assumptions that will be used to make listing decisions and indicate that site-specific data may be used in place of these default assumptions.

    MDNR Response:

    The Department is not clear where this information is stated in the LMD. The Department requests clarification from the commenter.

11. Comment received from Newman, Comley and Ruth

    The methodology for calculating average concentrations when duplicate samples are included in the dataset is unclear and is not consistent across existing 303(d) listing worksheets (examples included Crooked Creek, Strother Creek and Big Creek).

    MDNR Response and Action:

    The Department agrees, additional wording could be added to the listing methodology to describe how duplicate samples are handled (averaged). A note has already been added to many of the sediment worksheets indicating which duplicate samples were averaged. Other worksheets will be revised during the next listing cycles.

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Sediment Toxicity Comments

12. Comment received from EPA

    For toxic sediments in Table B-1, the sample mean is identified as the assessment number. If this is the mean of multiple sites along a segment, it could result in one site, of many sampled, being toxic but being averaged out by cleaner sites above and/or below that site. This could result in a portion of a segment being impaired but the segment not being listed. The table should identify the site mean rather than the sample mean to eliminate confusion.

    MDNR Response:

    The Department agrees this is a potential concern. When completing an assessment and the accompanying worksheet, if large differences in pollutant concentrations are observed in different parts of the same watershed, then the Department will assess each segment separately and will physically separate the data within the assessment worksheet. This process is the basis for the Department's frequent listing of only a portion of a water body.

13. Comments received from city of Springfield, Association of Missouri Clean Water Agencies, and city of St. Joseph

    The LMD provides little detail on how to analyze sediment data quality and does not include averaging procedures. In addition, multiple samples collected within one segment or reach should be averaged into a single data point for temporal comparisons and reporting limits. Data values below the detection or reporting limits (censored data) should be considered "0" as detection or reporting limits can be above the PECs and potentially lead to a false positive impairment decision.

    MDNR Response and Action:

    Sediment samples should be averaged using the geometric mean. Previously, in error, the Department had calculated concentration according to an arithmetic mean. In light of this error, the Department reassessed all sediment pollutant worksheets and recalculated using the geometric mean. As a result five streams will be requested to be delisted:

    - *Big River (WBID 2080) delisted for zinc in sediment*
    - *Shaw Branch (WBID 2170) delisted for cadmium in sediment*

- *Village Creek (WBID 2864) was shown as category 4A based on a 2010 TMDL for fine sediment deposition and lead*
- *Bee Fork (WBID3966) delisted for lead in sediment*
- *Turkey Creek (WBID 3217) delisted for lead in sediment*

Stream data may be assessed within smaller assessment reaches to delineate or bracket any potential areas of concerns (e.g., upstream and downstream comparisons). If data is statistically similar and no observed demarcation or known pollutant source is present within that reach/segment, then that set of data may be combined.

See MDNR response to comment 11.

Additional wording can be added to the LMD to describe how censored data is handled. This information will be provided on the next revision. In general, if data are reported less than the detection limit, the data value is divided by 2. If the value is greater than the criterion, the data is not used in the assessment. If the value is less than the criterion, the data is used in the assessment.

14. Comments received from Newman, Comley and Ruth

    The Department may use older data to assess present conditions if the data remains representative of present conditions. For sediment, since concentrations are not expected to experience the same variability as water column concentrations, the most recent sediment sample provides the best representative of conditions.

    MNDR Response:

    The Department agrees the most recent sediment data may be representative of current conditions, however, older data may be of value to gain an overall understanding of historical, ongoing, or sporadic events that may be occurring over time or indicate if conditions are improving.

TMDL Comments

15. Comments received from MSD, city of Springfield, and city of St. Joseph

    Water bodies currently listed as impaired for water quality criteria or beneficial uses that are expected to change in the near future should be considered low priority for Total Maximum Daily Load development.

MDNR Response and Action:

While prioritization of TMDLs is a 303(d) listing function, EPA policy no longer requires States to include this information as part of the 303(d) listing process. A TMDL schedule is developed by the program; therefore, this comment will be shared with program staff. The present TMDL schedule can be found on the Department's TMDL website: http://dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-progress.htm

Data Age, Quantity, Quality, and Minimum Sample Size comments

16. Comments received from MSD, city of Springfield, Association of Missouri Clean Water Agencies, and city of St. Joseph

    Data age, quantity, and minimum sample size should be addressed when making impairment decisions. Any data greater than 7 years old should be considered suspect. Small data sets should not be used (e.g., less than 10 samples). Waters with small data sets should be placed with suspected impairments into Categories 2B or 3B until sufficient data are available to make informed decisions.

    MDNR Response:

    As stated by the EPA, data should not be treated as unrepresentative of water quality conditions solely on the basis of age. Older data and information should be considered unless supporting information indicates the data are not a representative of current conditions. An explanation is provided in the LMD.

    Department currently provides short, concise and descriptive comments on every assessment worksheet describing the assessment procedures followed. There may be worksheets that need additional information or explanation. The Department will review worksheets and update as necessary and as time allows. The public are welcome to indicate specific water bodies they feel are lacking written justification.

    Regarding sample size, although, the listing methodologies do not provide a set value necessary for making a listing determination, these values can be inferred by referencing the data quality code explanations.

17. Comments received from MSD and Association of Missouri Clean Water Agencies

    A complete factsheet should be provided for each listing and delisting decision and for each water body proposed for assignment to Categories 2B, 3B, and 4C.

MDNR Response:

The Department does not clearly understand the suggestion of creating a factsheet for each listing category (2B, 3B, 4C, or 5) for each water body assessed. If we understand the comment correctly, this would cause the Department to potentially create hundreds of factsheets for all the water bodies placed in categories 2B, 3B, 4C, and 5. This is because each water body has multiple designated beneficial uses that are assessed and placed in one of five major categories (which each major category may include additional subcategories); resulting in one water body having multiple factsheets developed.

The Department appreciates the comment; however, at this time the Department does not have the resources to complete this type of work. However, the Department would like to remind stakeholders that water quality data and biological assessment reports are available for public review from the Department's website. The web links have been provided here for reference and ease of access. These websites have been available from the Department's website for a number of years, but may have not been widely known or easily located. In the future, the Department will provide web links from the 303(d) webpage.

- *Web link to the Department's on-line searchable Water Quality Assessment Database.*
  http://dnr.mo.gov/mocwis_public/wqa/waterbodySearch.do
- *Web link to the Department's Environmental Services Program, Water Quality Monitoring Section. From the below link, you will find links to Aquatic Macroinvertebrates Bioassessment Reports, and on-line database.*
  http://dnr.mo.gov/env/esp/wqm/biologicalassessments.htm

18. Comments received from Association of Missouri Clean Water Agencies and city of St. Joseph

    The Department should post all data used to support the 303(d) listing and quality assurance project plans (QAPPs) on the 303(d) webpage. The Department should certify that all the data used for actual 303(d) listings meet the requirements of the QAPP.

    MDNR Response:

    The Department's QAPPs can be provided at anytime upon request through a Sunshine Request. Biennially, the Department requests data and supporting documentation from other data collection entities (e.g., other state agencies, local governments, Universities, federal governments, etc.). Supporting documents include, field and laboratory

procedures, monitoring plans, quality control information, field and laboratory staff experience and training. The Department reviews this information to ensure monitoring data is collected following EPA approved methods and the field and analytical staff have qualifications to complete the scope of work.

19. Comments received from Newman, Comley and Ruth

    A stream should not be listed as impaired for a single macroinvertebrate sample if there is only one sample collected and it receives a score of 14 or lower.

    MDNR Response:

    A according the data code requirements for biological assessments for macroinvertebrates, a water body cannot be listed as impaired based upon a single data point. In cases where only one macroinvertbrate sample has been collected from a water body, the water body is placed in either the 2B or 3B category until additional data is available.

Water Quality Criteria Comments

20. Comments received from MSD, city of Springfield, Association of Missouri Clean Water Agencies, and city of St. Joseph

    The *E. coli* value listed in Table 1.1 is not a groundwater protection criterion.

    MDNR Response and Action:

    The Department agrees with this comment. The groundwater protection criteria will need to be addressed by a beneficial use assignment in a future water quality standards revision. The reference to "groundwater" will be removed and replaced with "losing stream."

21. Comment received from MSD

    Environmental indicators used to detect beneficial use impairment on a statewide basis should be limited to criteria or requirements listed in Missouri's Water Quality Standards.

    MDNR Response:

    The Department has a responsibility of protecting all waters of the state under the antidegradation, general (narrative) criteria, and specific criteria sections provided in 10 CSR 20-7.031 (2), (3) and (4), respectively. The general (narrative) criteria states "the

following water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contamination, by itself or in combination with other substances shall prevent the water of the state from meeting the following conditions." The general criteria continues to outline these conditions in a series of "free from" statements which includes color, turbidity, offensive odor, unsightly bottom deposits and the prevention of the full maintenance of beneficial uses. The listing methodology has provided criteria for which quantifiable measurements can be made and compared to control stream segments (e.g., upstream) or, other local streams to compare differences and/or similarities.

Biological Assessments and Habitat Comments

22. Comment received from Newman, Comley and Ruth

    After the Clean Water Commission approval of the 2012 Listing Methodology Document (LMD), the Department hosted Biological Assessment workgroup meetings to consider changes to the 2014 LMD. A document titled "Evaluation of the Biological Data in the DNR Listing Methodology Document" was developed and workgroup members commented. It is unclear how the recommendations and unresolved issues were incorporated into the 2016 LMD.

    MDNR Response:

    A summary of how the recommendations were incorporated into the 2016 LMD was provided to the Bioassessment Workgroup during a meeting held on February 26, 2014.

23. Comments received from MSD, city of Springfield, city of St. Joseph, and Newman, Comley and Ruth

    Including considerations for habitat limitation have strengthened the fish community assessment listing methodology protocols, but these protocols may need to be refined. There are several questions about how the habitat metrics and 0.39 threshold were chosen. It was also suggested to revise footnote 20 to improve consistency with Appendix E.

    MDNR Response:

    The Department continues to work with members of the biological assessment workgroup to discuss and resolve any on-going concerns. When completing biological assessments, the assessment staff will also review all available data including habitat scores. If there is any question about the data, staff will consult with the appropriate biologist (fish or macroinvertebrate) to gain specific information about the site and conditions. The

Department will continue to work with the Bioassessment Workgroup to refine the biological assessment criteria. Additional information, regarding biological workgroup meetings(s) will be forthcoming. We look forward to your participation.

The Department has revised the wording of footnote 20 as suggested.

24. Comment received from Newman, Comley and Ruth

Currently, when habitat assessment data indicates habitat scores are less than 75 percent of reference or appropriate control streams, the Department reports that the 75 percent habitat threshold and MSCI score of 16 are not interchangeable. Based upon reviewing from Plafkin et. al (1989) study results, it has been suggested it would be more appropriate to set the habitat score at 90 percent.

MDNR Response:

The Stream Habitat Assessment Project Procedure (SHAPP) [which draws from the Plafkin et al. (1989) document] states, "The total score from the physical habitat assessment of the study sites is expected to be from 75% to 100% similar to the total score of the reference site in order to support a comparable biological community." The following table, a slight modification of Plafkin et al. (1989), is found in the SHAPP.

Habitat assessment categories are as follows:	
1) Comparable to Reference	≥90%
2) Supporting	75-89%
3) Partially Supporting	60-74%
4) Non-supporting	<59%

Based on this breakdown, the 75 percent habitat quality threshold is appropriate to use for determining whether a test site should be capable of a fully supporting macroinvertebrate community. By comparison, the 90 percent threshold goes beyond supporting and into the range of reference quality.

25. Comments received from the EPA, MSD, city of Springfield, city of St. Joseph, and Newman, Comley and Ruth

The Department should specify the methods for choosing appropriate reference and control streams for biological data comparisons. Specific examples include: The fish community Index of Biotic Integrity (IBI) comparisons should only occur in streams from similar ecoregions where adequate relationships between IBI scores and impairments exist. Test/subject streams should be compared to control streams with similar land use, geology, watershed size, and stream morphology. Stakeholders urge the

Department to begin using the Missouri Resources Assessment Partnerships Valley Segment Type mapping layer that has been adopted by reference in the State's water quality standards.

MDNR Response:

The Department provided a detailed explanation of how these streams are selected. This information was given in a document produced by the Department and a group of stakeholders interested in the Department's use of biological data. Several stakeholders, including EPA Region 7, participated in the workgroup. The document was shared with the group members, and all on the 303(d) stakeholder group mailing list. The document is not available from the Department's website, but it can be made available upon request.

In addition, the Department is currently beginning work on a tiered aquatic life use designation. Part of that foundation work for doing this is defining, selecting, and biomonitoring of small order stream classifications. When this work is completed and promulgated with water quality standards, there will be a clear separation between streams that need to be assessed using different scoring procedures based on their stream/watershed size and/or aquatic life use tier. Until then, the Department will continue to rely on the best professional judgment of the Department's biologist to decide when a target stream needs to be assessed against a group of small control streams rather than the Macroinvertebrate Stream Condition Index (MSCI) reference streams.

26. Comment received from EPA

In relation to footnote 16 in Table 1.2, there are only two Mississippi Alluvial Plains reference streams identified in the state's water quality standards; these are Main Ditch and Maple Slough Ditch. This is to cover three Ecological Drainage Units. Because of the limited number of reference streams it is even more important that a method for choosing appropriate control streams is outlined in the state's listing methodology where the use of control streams is allowed in the state's water quality standards.

MDNR Response:

The Department agrees. This procedure will be improved by the development and promulgation of tiered aquatic life use designation specifically for streams in the Mississippi Embayment.

27. Comment received from Newman, Comley and Ruth

    The aquatic invertebrate protocol describes full attainment of beneficial uses for 7 samples or fewer, and when 75 percent of the stream condition index scores are 16 or greater or 14 or lower. What happens when there is an even split in the scores (14, 14, 16, 16)?

    MDNR Response:

    In the example provided the data would be considered inconclusive and the water body placed in category 2B or 3B until additional information becomes available.

28. Comment received from Newman, Comley and Ruth

    The Department should include habitat evaluation information on the biological assessment worksheets, along with the control streams information so the information is transparent and allows external entities to understand and compare the information provided.

    MDNR Response and Action:

    The Department agrees. This information can be incorporated into future biological assessment worksheets. In addition, aquatic macroinvertebrate data and reports can also be accessed from the Department's website. This information has been available for a number of years, but may have not been widely known or easily located. The web link has been provide here for reference and will be added to the LMD and 303(d) website.

    - *Web link to the Department's Environmental Services Program, Water Quality Monitoring Section. From this link, one will find links to the Aquatic Macroinvertebrates Bioassessment Reports, and on-line database: http://dnr.mo.gov/env/esp/wqm/biologicalassessments.htm*

29. Comments received from MSD, city of Springfield, city of St. Joseph, and Newman, Comley and Ruth

    The Department should clarify how it intends to apply and interpret "other biological data" when listing or de-listing water body segments. Other biological endpoints should be carefully assessed if considered for impairment decisions.

MDNR Response:

The Department may use "other biological data" when data is available for a particular water body. Because there are many other types of biological data, there is not just one method that would be used to assess this data. Generally the standard statistical hypothesis test would be the main tool used, however, in statistics the nature of the data itself often defines which tests may be more appropriate.

30. Comments received from MSD, city of Springfield, city of St. Joseph, and Newman, Comley and Ruth

    The "Weight of Evidence" approach used to translate narrative criteria should be more clearly explained.

    MDNR Response and Action:

    Several years ago, the Clean Water Commission discussed that whenever a listing decision is made based on narrative criteria, a "Weight of Evidence" approach will be followed. As a result of this discussion, the Department provides all assessment worksheet information that may be relevant to a "Weight of Evidence" listing decision. The "Weight of Evidence" approach is not a type of assessment, but a method for analyzing and synthesizing information. Overall, the Department will look at all available data to determine if the beneficial uses are being met. This could be completed through conditional or causal type of Weight of Evidence approach. Clarification will be provided in the LMD.